CLAIMS

1. An acceleration sensor comprising:

a base plate; and

first and second resonators each formed of a piezoelectric material and each having electrodes on two opposite main surfaces thereof, each resonator having a vibrating section at an intermediate portion of the resonator with respect to the longitudinal direction thereof,

wherein the first and second resonators are attached to opposite sides of the base plate with respect to a direction in which acceleration is applied so as to define a bimorph acceleration-sensor element, wherein one longitudinal end or both longitudinal ends of the acceleration-sensor element is/are fixed such that the first and second resonators bend in the same direction in response to the acceleration, and wherein changes in frequency or changes in impedance in the first and second resonators caused by the bending of the acceleration-sensor element are differentially detected in order to detect the acceleration,

wherein opposite sides of the acceleration-sensor element with respect to the application direction of acceleration are respectively covered with a pair of casing components, and

wherein the first and second resonators are attached to the base plate in a manner such that the electrodes of the

first and second resonators face at least one of opposite open planes defined by a combination of the acceleration-sensor element and the casing components with respect to a direction perpendicular to the application direction of acceleration.

2. The acceleration sensor according to Claim 1, wherein one of the opposite open planes defined by the combination of the acceleration-sensor element and the casing components with respect to the direction perpendicular to the application direction of acceleration is provided with a first electrode connected with one of the electrodes of the first resonator; a second electrode connected with one of the electrodes of the second resonator; and a third electrode connected with the other electrode of the first resonator and with the other electrode of the second resonator.

3. The acceleration sensor according to one of Claims 1 and 2, wherein the base plate and the first and second resonators are formed of at least one material having substantially the same coefficient of thermal expansion.

4. The acceleration sensor according to any one of Claims 1 to 3, wherein only one longitudinal end of the

acceleration-sensor element is fixed,

wherein the opposite open planes defined by the combination of the acceleration-sensor element and the casing components with respect to the direction perpendicular to the application direction of acceleration are respectively covered with a pair of cover components such that a displacement portion of the acceleration-sensor element, which is bendable in response to the acceleration, is disposed within an enclosed space,

wherein one of the electrodes in each of the first and second resonators is disposed at a free-end side of the resonator and is connected with a common electrode via an extraction electrode provided on the base plate, the common electrode being provided at a fixed-end side of an outer surface of a combination of the casing components and the cover components,

wherein the other electrode in the first resonator is disposed at a base-end side of the first resonator, said electrode being connected with a first independent electrode provided at a free-end side of the outer surface of the combination of the casing components and the cover components, said electrode being connected with the first independent electrode via a first extraction electrode provided on one of the casing components, and

wherein the other electrode in the second resonator is

disposed at a base-end side of the second resonator, said electrode being connected with a second independent electrode provided at the free-end side of the outer surface of the combination of the casing components and the cover components, said electrode being connected with the second independent electrode via a second extraction electrode provided on the other casing component.

5. The acceleration sensor according to any one of Claims 1 to 4, wherein a height of the first and second resonators in the direction perpendicular to the application direction of acceleration is smaller than a height of the base plate in the direction perpendicular to the application direction of acceleration.

6. The acceleration sensor according to Claim 5, wherein the first and second resonators are attached to the opposite sides of the base plate at positions where the first and second resonators are opposed to each other.

7. The acceleration sensor according to Claim 6, wherein each of the first and second resonators is attached to a central portion of the base plate with respect to a height direction of the base plate, the height direction being perpendicular to the application direction of acceleration.